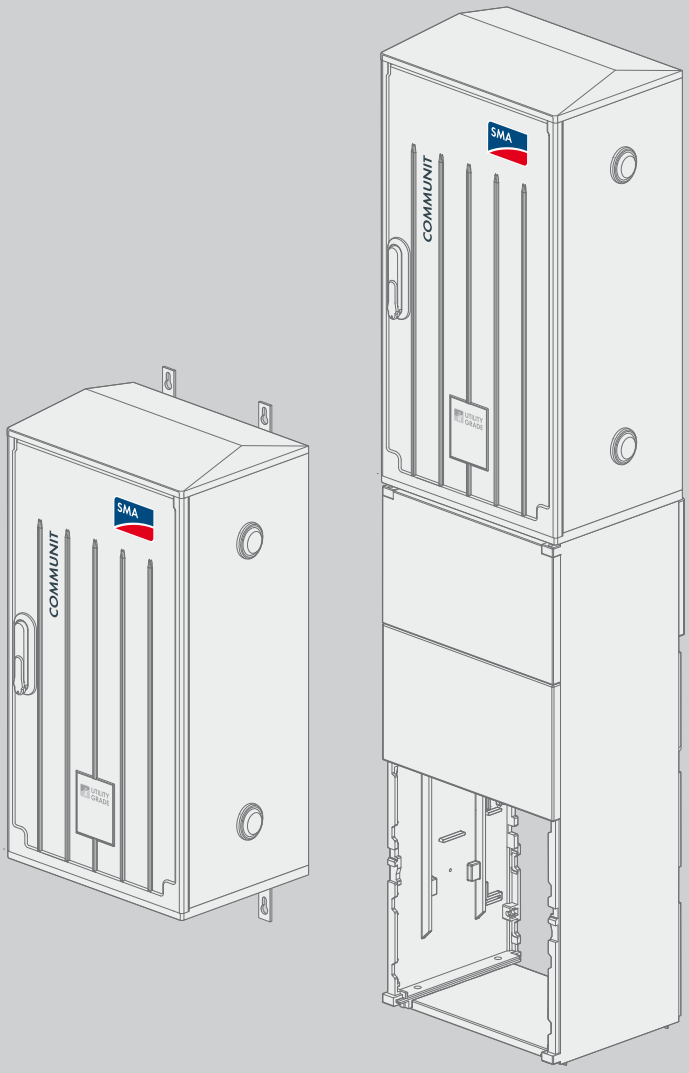
Installation Manual

Communit



Legal Provisions

The information contained in this document is the property of SMA Solar Technology AG. Publishing its content, either partially or in full, requires the written permission of SMA Solar Technology AG. Any internal company copying of the document for the purposes of evaluating the product or its correct implementation is allowed and does not require permission.

SMA Warranty

You can download the current warranty conditions from the Internet at www.SMA-Solar.com.

Trademarks

All trademarks are recognized, even if not explicitly identified as such. A lack of identification does not mean that a product or symbol is not trademarked.

The BLUETOOTH® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of these marks by SMA Solar Technology AG is under license.

Modbus® is a registered trademark of Schneider Electric and is licensed by the Modbus Organization, Inc.

QR Code is a registered trademark of DENSO WAVE INCORPORATED.

Phillips® and Pozidriv® are registered trademarks of Phillips Screw Company.

Torx® is a registered trademark of Acument Global Technologies, Inc.

SMA Solar Technology AG
Sonnenallee 1
34266 Niestetal
Germany

Tel. +49 561 9522-0
Fax +49 561 9522-100
www.SMA.de
E-mail: info@SMA.de

© 2004 to 2015 SMA Solar Technology AG. All rights reserved.

Table of Contents

1 Information on this Document 5
1.1 Validity 5
1.2 Target Group 5
1.3 Additional Information 5
1.4 Symbols 5
1.5 Typographies 6
1.6 Nomenclature 6
1.7 Abbreviations 6
2 Safety 7
2.1 Intended Use 7
2.2 Safety Information 8
3 Product Description 10
3.1 Communit 10
3.2 Type Label 10
4 Scope of Delivery 12
5 Mounting 14
5.1 Selecting the Mounting Location 14
5.2 Mounting the Communit on the Wall 15
5.3 Mounting the Communit with Base 17
5.4 Determining the Optimum Mounting Location for the Antenna 19
5.5 Mounting the Antenna 20
5.6 Installing Your Own Optional Device 20
6 Electrical Connection 22
6.1 Overview of the Connection Area 22
6.2 Inserting the Cables into the Communication Distribution Unit 23
6.3 Connecting the Cables to the Connecting Terminal Plates 24
6.3.1 Connecting Conductors to the Spring-Cage Terminal 24
6.3.2 Connecting the Cable Shield Contact 25
6.3.3 Connecting the Communit Supply Voltage 25
6.3.4 Connecting the Cables for the SMA Cluster Controller 26
6.3.5 Connecting the Cables for the I/O Modules 26
6.3.6 Connecting the RS485 Cable of the Sunny SensorBox 27
6.3.7 Connecting the Voltage Supply of Your Own Optional Devices 28
6.4 Connecting the Cables to the Network Switch and Router 29
6.4.1 Connecting the Network Cables to the Network Switch 29
6.4.2 Connecting the Cable to the Router 30
6.5 Splicing and Connecting the Optical Fiber 30
6.6 Connecting the Network Cable via the Keystone Jack 31
7 Commissioning the Communit 33
7.1 Information on Commissioning 33
7.2 Configuring the Router 33
7.3 Configuring the Network Switch 35

7.4 Commissioning the Sunny WebBox 35
8 Communit Maintenance Work 36
8.1 Maintenance Interval 36
8.2 Checking the Mounting Location and Installation of the Communit 36
8.3 Checking the Enclosure and Enclosure Interior 36
8.4 Checking the Supply Voltage 36
9 Decommissioning 37
9.1 Disassembling the Communit 37
9.2 Disposing of the Communit 37
10 Troubleshooting 38
11 Technical Data 39
12 Contact 42

1 Information on this Document

1.1 Validity

This document is valid for the device type "Communit-10" from production version A1.

1.2 Target Group

The tasks described in this document must be performed by qualified persons only. Qualified persons must have the following skills:

- Knowledge of how a communication distribution unit works and is operated
- Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Training in the installation and configuration of IT systems
- Knowledge of and skills in the splicing of optical fibers
- Knowledge of all applicable standards and directives
- Knowledge of and adherence to this manual, the manuals of the communication devices including the specified safety information

1.3 Additional Information

Links to additional information can be found at www.SMA-Solar.com:

Document title	Document type
Communit	Technical Information
Plant Communication in Large-Scale PV Power Plants	Technical Information
RS485 Cabling Plan	Installation Manual

Further information on the operation of optional communication devices in the Communit such as the patch panel, the router or the network switches can be found on the website of the respective manufacturer and at www.SMA-Solar.com.

1.4 Symbols

Symbol	Explanation
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, can result in property damage
i	Information that is important for a specific topic or goal, but is not safety-relevant
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
✖	A problem that might occur

1.5 Typographies

Typography	Use	Example
Bold	• Elements to be selected • Elements to be entered	• Select **Home** in the menu.
>	• Several elements that are to be selected	• Select **Connectivity Settings > Internet Settings** in the menu.
[**Button/Key**]	• Button or key to be selected or pressed	• Select [**SAVE**].

1.6 Nomenclature

In this document, the Communit is also designated as the communication distribution unit.

1.7 Abbreviations

Abbreviation	Designation	Explanation
APN	Access Point Name	Name of connection point in a GPRS backbone, allowing access to an external packet data network
GSM	Global System for Mobile Communication	-
IP	Internet Protocol	-
IT	Information Technology	–
MMF	Multi-Mode Fibre	Optical fibre transmitting signals at several wavelengths
OF	Optical Fibre	–
PIN	Personal Identification Number	–
PV	Photovoltaik	–
SC	Subscriber Connector	Plug for connection via optical fibre
SIM	Subscriber Identity Module	Card used to identify a subscriber on mobile communication devices
SMF	Single-Mode Fibre	Optical fibre transmitting signals at one wavelength
UMTS	Universal Mobile Telecommunications System	System succeeding GSM

2 Safety

2.1 Intended Use

The Communit is a central communication distribution unit of a large-scale PV power plant integrating all the communication devices.

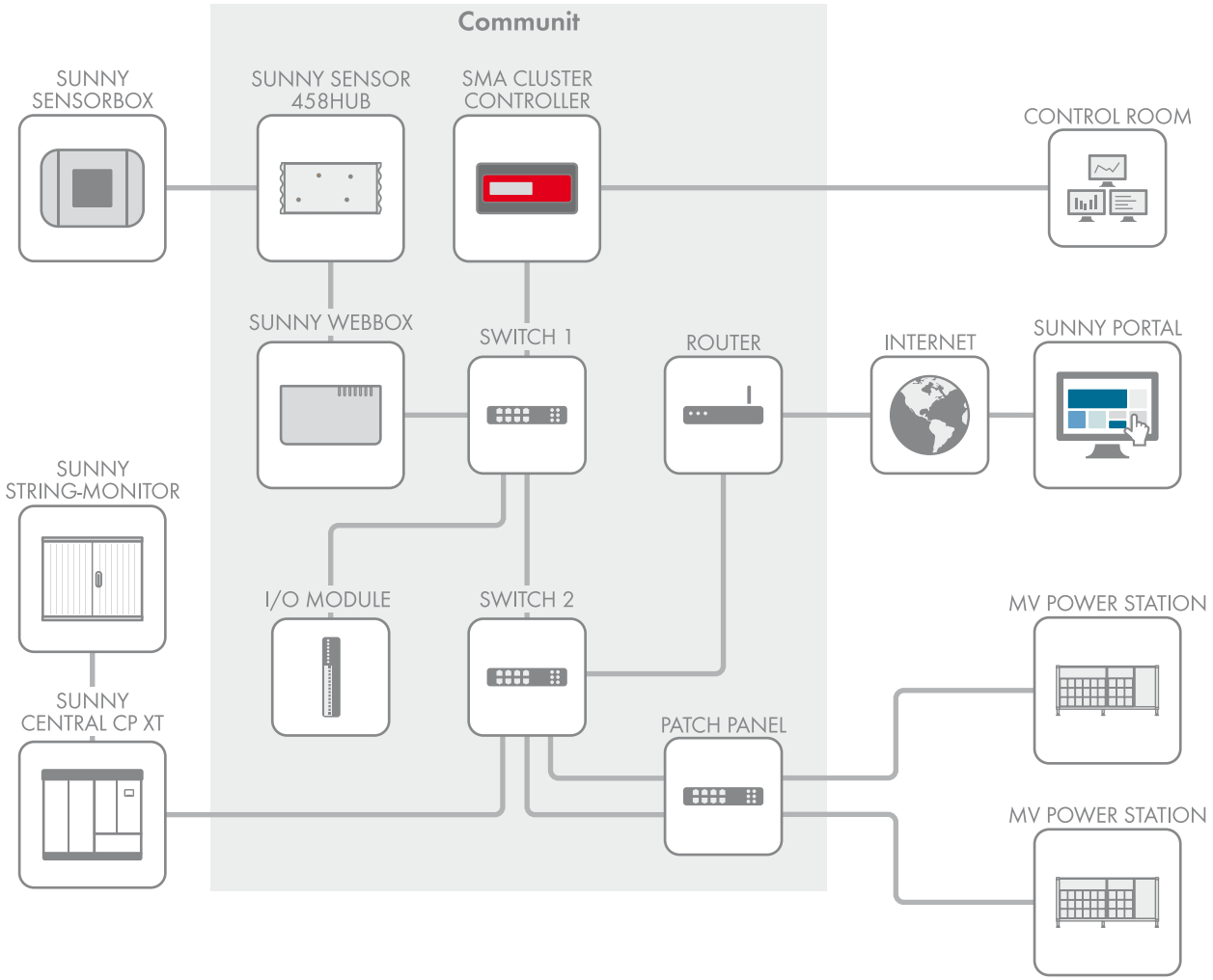


Figure 1: Communit in a large-scale PV power plant (example)

The Communit is suitable for indoor and outdoor use.

The Communit can be used in large-scale PV power plants with Sunny Central, Sunny Mini Central or Sunny Tripower.

If you have selected the option "Customer Installation Location" in the option code of the Communit, the Communit is supplied with one or two installation locations for your own communication devices. During installation, observe the requirements for each device to be installed:

- The device must be approved for operation at the mounting location, e.g. the device must have a valid declaration of conformity in Europe.
- The device must have the following technical data:
  - Permissible ambient temperatures: –20°C to +60°C
  - Emitted interference: Class A (as per EN55022: 2006+A1: 2007)
  - Interference immunity: Class A (as per EN55024: 1998+A1: 2001 +A2:2003)
- The device can be mounted on a top-hat rail.
- The device has suitable dimensions for the available space: 226 mm x 130 mm x 71 mm (width x height x depth).

- The device must be suitable for connection to voltage supply:
  - Device for installation location 1: AC voltage supply, maximum power consumption 20 W or DC voltage supply; information on maximum power consumption, see the Technical Information "Communit"
  - Device for installation location 2: only DC voltage supply; information on maximum power consumption, see the Technical Information "Communit"

For optimum operation of the Communit, observe the requirements for the mounting location (see Section 5.1 "Selecting the Mounting Location", page 14).

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. modifications or conversions, are only permitted with the express written permission of SMA Solar Technology AG. Making unauthorized changes will void the warranty and warranty claims and will normally result in invalidation of the operating permit. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

Any use of the product other than described in the Intended Use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein.

The type label must remain permanently attached to the product.

2.2 Safety Information

This section contains safety information that must be observed at all times when working on or with the product. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠ DANGER

Danger to life due to electric shock when voltage is present

Danger of electric shock if work is executed incorrectly or under fault conditions.

- Disconnect the supply voltage before performing any work on the Communit.
- Observe the five safety rules when disconnecting the supply voltage:
  - Disconnect the device from voltage sources.
  - Ensure that the device cannot be reconnected.
  - Ensure that no voltage is present.
  - Ground and short-circuit the device.
  - Cover and isolate any adjacent live components.

⚠ CAUTION

Damage to eyes and skin due to visible and invisible laser radiation

The Communit contains class 1 LED or laser components in accordance with IEC 60825-1 (2003). Invisible laser radiation, wave length: 1,300 nm.

The laser beam appears at the end of the optical fiber.

- Do not look into the laser beam.
- Do not look at the laser beam using optical instruments.
- Do not point the laser beam at people.

NOTICE

Property damage due to tampering

The product and the PV system can be damaged when tampered with.

- Always close and lock the product.
- Remove the key from the door lock.
- Store the key in a secure location.

Property damage due to dust intrusion and moisture penetration

Dust or moisture intrusion can damage the product and impair its functionality.

- Do not open the enclosure during rainfall or when humidity is below or above the thresholds. The humidity thresholds are: 5% to 95%.
- Close and lock the enclosure.
- The product must always be closed for storage.
- Always store the product in an upright position with the connection area facing downwards.
- Store the product in a dry and covered location.
- The temperature at the storage location must be in the specified range. The temperature range is: –20°C to +50°C.

Ensuring data security in Ethernet networks

When accessing via the Internet, there is the risk that unauthorized users may access and manipulate the data or devices in your system.

- Take suitable protective measures (e.g. set up a firewall, close network ports that are not required, only enable remote access via the VPN tunnel, set up port forwarding).

3 Product Description

3.1 Communit

The Communit is a central communication distribution unit of a large-scale PV power plant integrating all the communication devices. The configuration of the Communit depends on the order option.

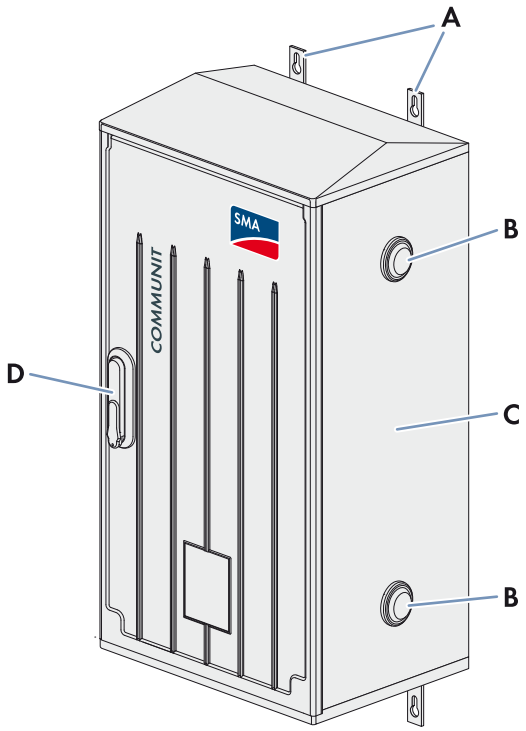


Figure 2: Design of the Communit

Position	Designation
A	Mounting rails
B	Vent plugs
C	Enclosure
D	Switch cabinet lock

3.2 Type Label

The type label provides unique identification of the Communit. There are two type labels attached to the Communit. The type labels are located on the right-hand inside panel and on the right-hand outside panel of the Communit. You will find the following information on the type labels:

- Device type and option code
- Serial number
- Device-specific characteristics

You require the information on the type labels to use the Communit safely and when seeking customer support from the SMA Service Line. The type labels must be permanently affixed to the Communit.

Symbols on the type label and in the Communit

Symbol	Explanation
	Danger to life due to high voltages Danger of electric shock if work on the product is executed incorrectly. All work on the product must be carried out by qualified persons only.
	Risk of burns due to hot surfaces The Communit can contain devices that can have a strongly increased surface temperature during operation.
	Laser radiation The Communit contains LED or laser components in accordance with IEC 60825-1 (2003). Laser class 1 - Class 1 Laser Product Light emitting diode class 1 - Class 1 LED Product
	Observe the documentation Observe all documentation supplied with the product.
	WEEE designation Do not dispose of the Communit together with the household waste but only in accordance with the locally applicable regulations for disposal for electronic waste.
	CE marking The product complies with the requirements of the applicable EU directives.
	Degree of protection IP54 The Communit is protected against dust intrusion and water penetration. The Communit is suitable for outdoor installation.

4 Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your distributor if the scope of delivery is incomplete or damaged.

Wall Mounting Option

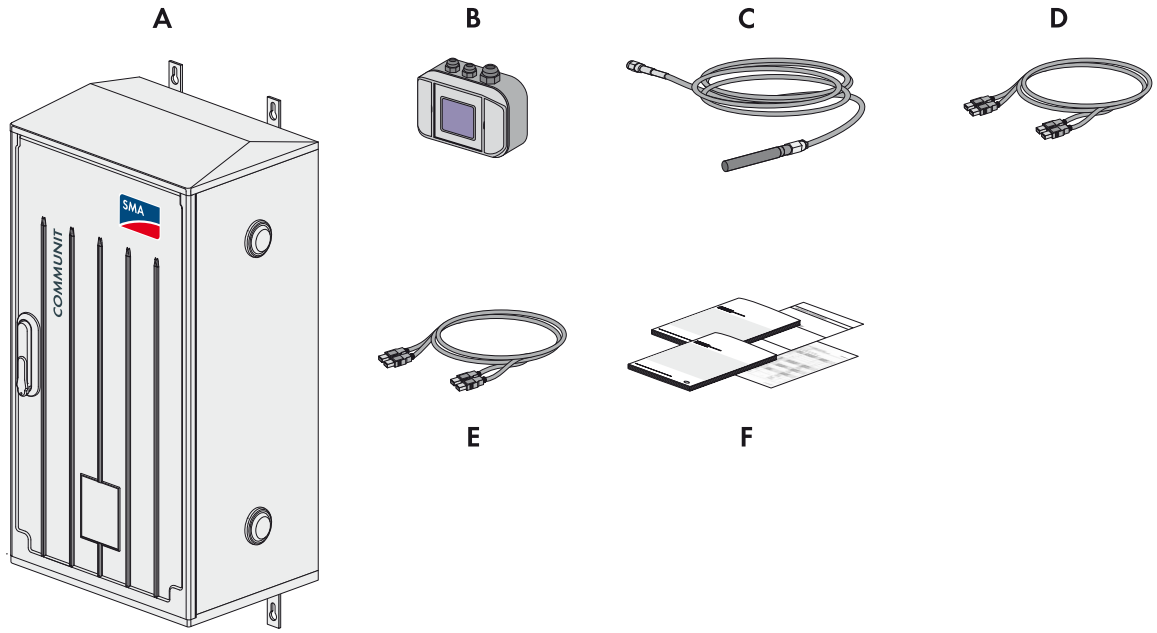


Figure 3: Components for the wall mounting option

Position	Quantity	Designation
A	1	Communit
B	1	Sunny SensorBox*
C	1	Antenna*
D	2/4	SC/SC optical fiber patch cable, 0° polish 50/125 µm MMF*
E	2/4	SC/SC optical fiber patch cable, 0° polish 9/125 µm SMF*
F	1	Installation manual, circuit diagram, documentation of the installed devices**

* optional
** depending on the option ordered

Base Mounting Option

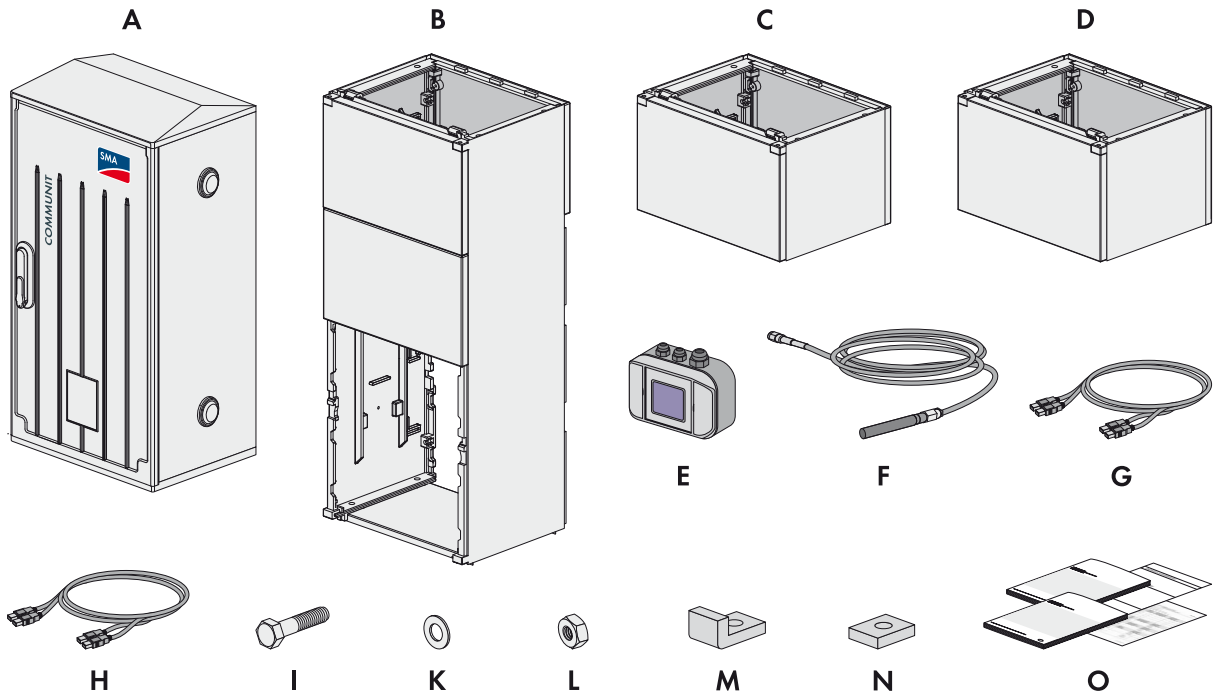


Figure 4: Components for the base mounting option

Position	Quantity	Designation
A	1	Communit
B	1	Base
C	1	First base extension
D	1	Second base extension
E	1	Sunny SensorBox*
F	1	Antenna*
G	2/4	SC/SC optical fiber patch cable 0° polish 50/125 µm MMF*
H	2/4	SC/SC optical fiber patch cable 0° polish 9/125 µm SMF*
I	12	Screw
K	24	Washer
L	12	Nut
M	8	Square washer with bracket
N	4	Square washer
O	1	Installation manual, circuit diagram, documentation of the installed devices**

* optional
** depending on the option ordered

5 Mounting

5.1 Selecting the Mounting Location

Requirements for the mounting location:

- ☐ The ambient temperature is within the operating temperature range of –20°C to +50°C.
- ☐ The humidity is within the range of 5% to 95%.
- ☐ The altitude of the mounting location is below the maximum installation altitude of 4,000 m above sea level.
- ☐ The mounting location is in an industrial area.
- ☐ The mounting location must not block any escape routes.
- ☐ The mounting location is clear and safely accessible at all times without the use of additional aids being necessary (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may restrict servicing.
- ☐ The mounting location is suitable for the weight and dimensions of the Communit.
- ☐ The mounting location is not exposed to direct solar irradiation.
- ☐ Mounting location is protected from rain as far as possible.

Overvoltage protection for installation altitudes above 2,000 m

For installation altitudes above 2,000 m, the overvoltage category is reduced to class II in accordance with EN 50178.

- If necessary, install overvoltage protection modules. Thus, overvoltages of category III can be reduced to overvoltages of category II.

Disconnection device

A disconnection device must be available for the installation work and commissioning in order to safely disconnect the Communit from the voltage supply.

- Install a disconnection device close to the Communit. The disconnection device must be easily accessible.

Requirements for the bridging time in the event of voltage dips

The operators of PV systems are obliged to fulfill the requirements of the feed-in directives valid at the respective system location.

The directives demand, depending on the system location, among other things the continued operation of the PV power plant (including measures for grid stabilization) even in the event of short-term voltage dips.

In order to ensure this, the Communit is fitted as standard with a redundant electricity supply that ensures a bridging time of 150 ms.

For further requirements, such as in unstable utility grids, SMA Solar Technology AG offers a redundant electricity supply with an additional maintenance-free buffer module based on capacitors. A bridging time of at least six seconds is thus ensured.

This support is not valid for the customer installation location.

Observe permitted mounting position

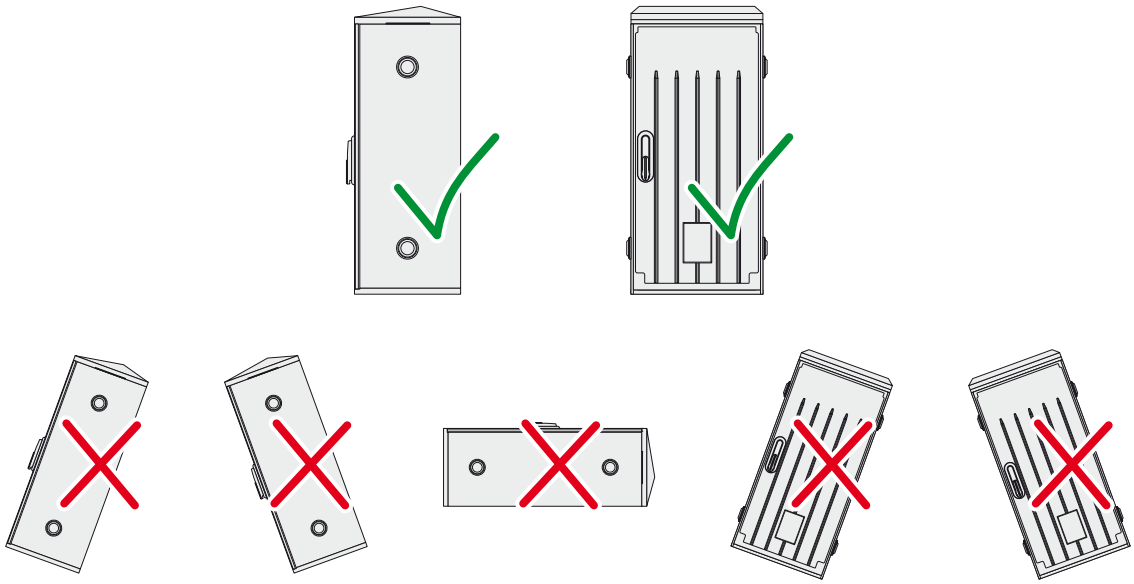


Figure 5: Permissible mounting positions of the Communit

Procedure:

- Mount the Communit in a permissible position.

5.2 Mounting the Communit on the Wall

Additionally required mounting material (not included in the scope of delivery):

☐ Four screws. Take the diameter of the holes in the mounting rails, the wall properties and the weight of the Communit into account.

☐ If necessary, screw anchors and washers.

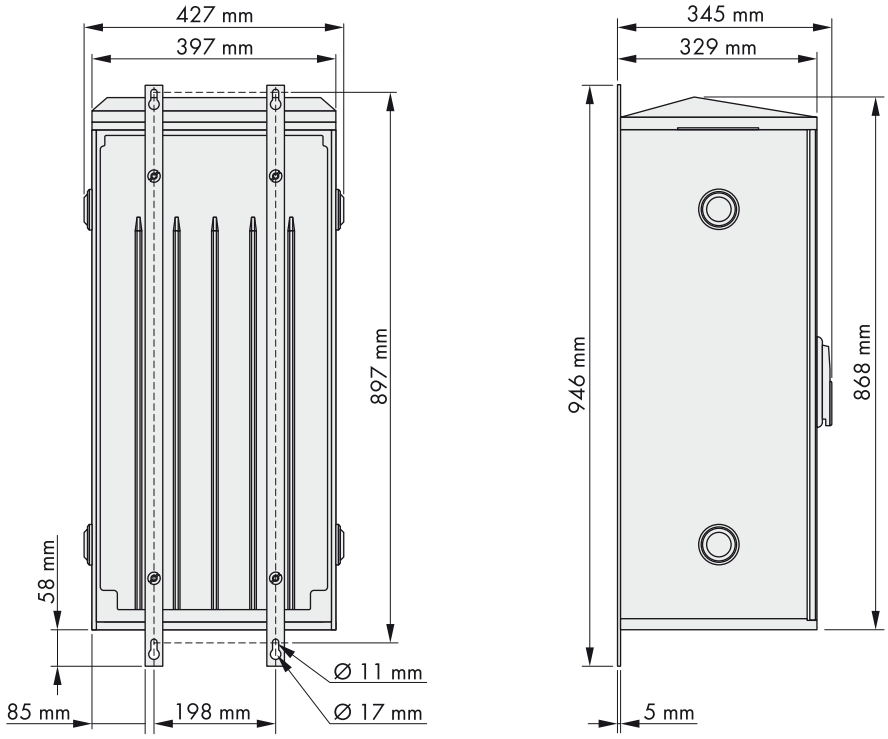


Figure 6: Dimensions of the Communit for wall mounting

⚠ CAUTION

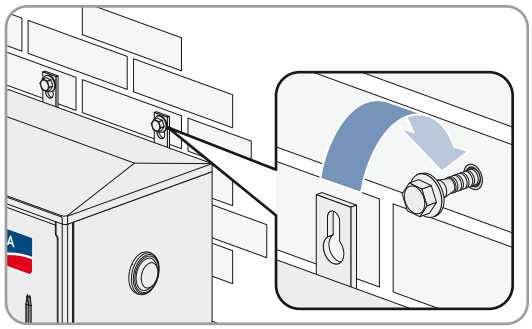
Risk of injury due to inappropriate transport or mounting of the product

The product is heavy. If you try to move the product on your own, you run a risk of being injured. The maximum product weight is 45 kg.

- Always have two persons transport and mount the product.
- Wear suitable personal protective equipment for all work on the device.

Procedure:

1. Mark the positions of the mounting holes on the wall.
2. Drill the mounting holes.
3. Insert screw anchors, if necessary.
4. Tighten the screws with washers in the screw anchors. The screws must protrude 10 mm from the wall.
5. Hang the Communit on the screws and align.



6. Tighten all screws.
7. Ensure that the Communit is firmly positioned.
8. Ensure that all connectors inside the Communit are firmly positioned.

5.3 Mounting the Communit with Base

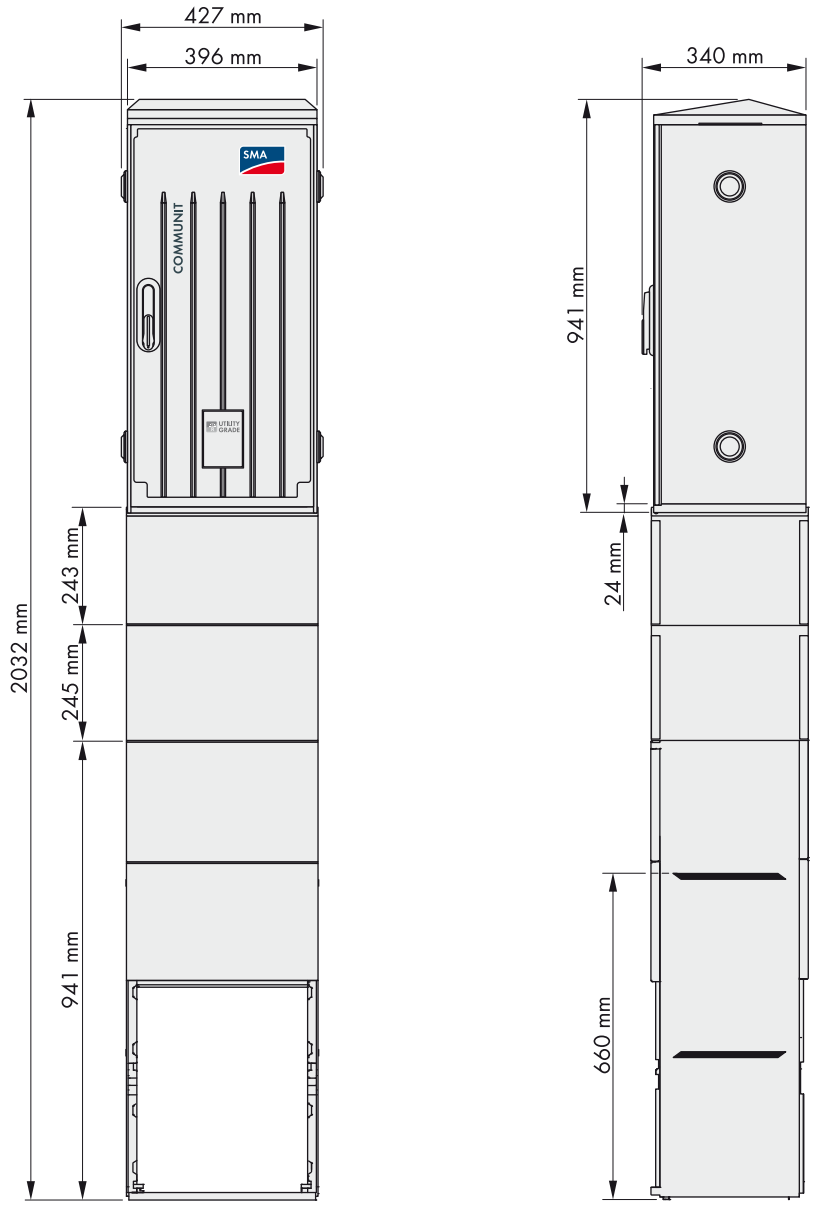


Figure 7: Dimensions of the Communit for base mounting

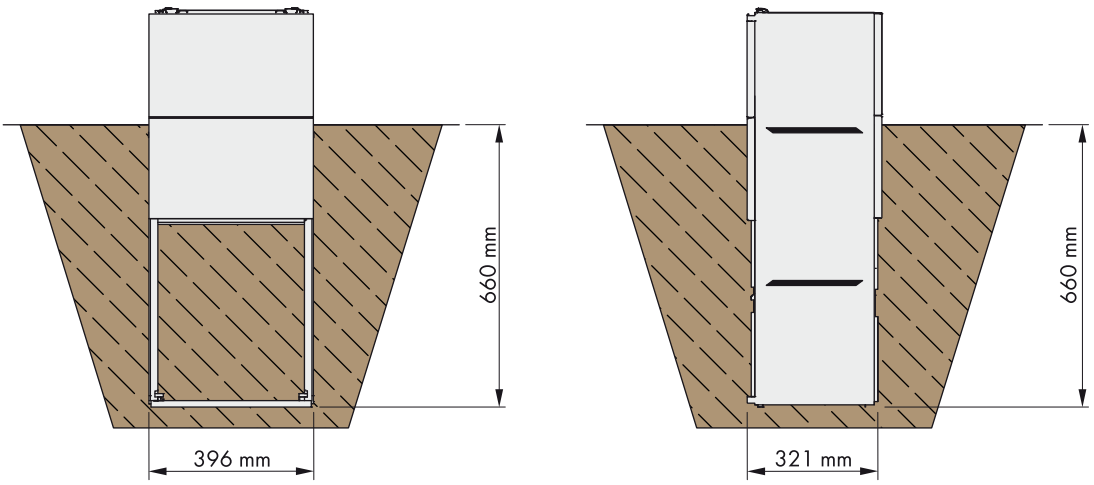


Figure 8: Dimensions of the pit for base mounting

⚠ CAUTION

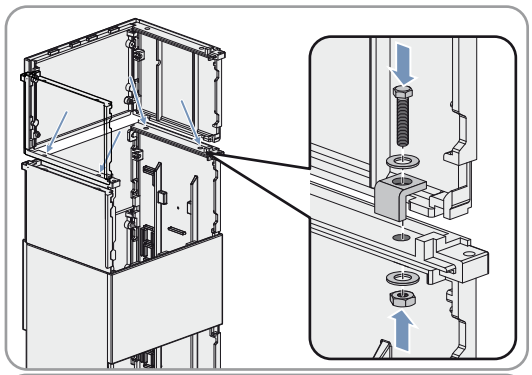
Risk of injury due to inappropriate transport or mounting of the product

The product is heavy. If you try to move the product on your own, you run a risk of being injured. The maximum product weight is 45 kg.

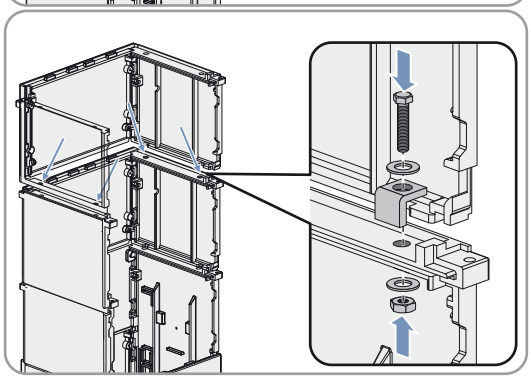
- Always have two persons transport and mount the product.
- Wear suitable personal protective equipment for all work on the device.

Procedure:

1. Excavate a pit. Ensure that the burial depth for the base is 660 mm. Tip: the optimum burial depth is marked on the sides of the base.
2. Place the base in the excavated pit. The side with the kick plate must be at the front.
3. Attach the base extensions to the base:
   - Place the first base extension on the base.
   - Screw the first base extension into place at the four anchoring points. Use the square washers with brackets.



   - Place the second base extension on the first base extension.
   - Screw the second base extension into place at the four anchoring points. Use the square washers with brackets.



4. Lay all cables necessary for connecting the Communit. Observe all protective measures relating to the type of cable-laying and the cable-laying specifications of the cable manufacturer.

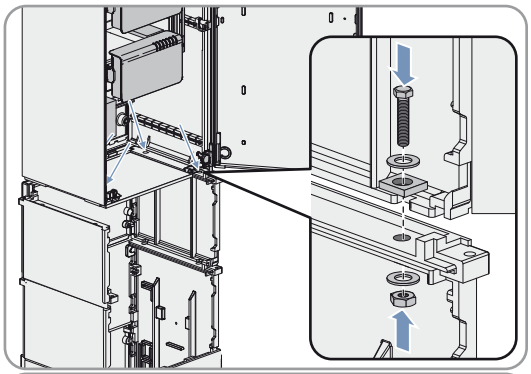
   NOTICE

   Damage to the cables due to compaction of the ground

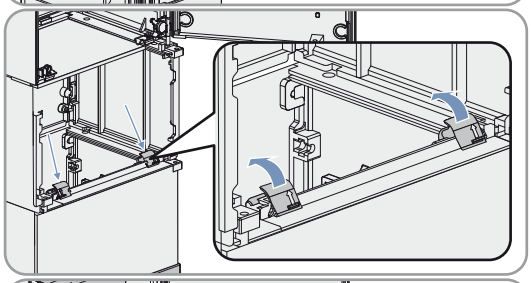
   Heavy mechanical pressure during compaction of the ground can damage the cables.

   - Protect the cables in the ground, for example by back-filling with sand or by using protective conduits.
5. Lead all necessary cables through the base and the base extensions. Take the length of the cables up to the connection points into account (see Section 6.1 "Overview of the Connection Area", page 22).
6. Fill the pit with fine gravel up to the burial depth.
7. Compact the ground sufficiently.
8. Ensure that the base is firmly positioned.
9. Position the Communit on the base extension.

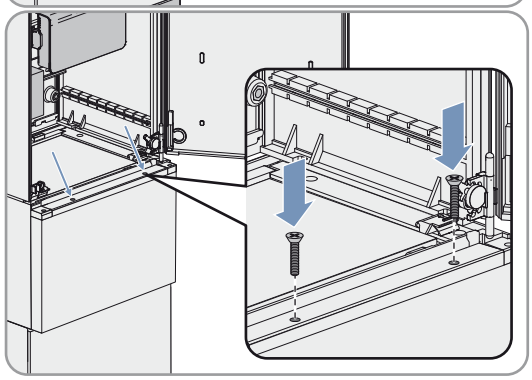
10. Screw the Communit into place at the four anchoring points on the base extension. Use the square washers.



11. Mount the lower kick plate on the first base extension and turn the locking latches inwards.



12. Mount the upper kick plate under the Communit on the second base extension and attach using two countersunk screws.



13. Ensure that all connectors inside the Communit are firmly positioned.

5.4 Determining the Optimum Mounting Location for the Antenna

If you have ordered the Communit with a UMTS router, the antenna included in the delivery must be mounted.

Lightning protection

Observe the local lightning protection regulations when mounting the antenna.

⚠ CAUTION

Radiation hazard due to high power density of the antenna

Electromagnetic radiation from the antenna can be damaging to health.

- Maintain a personal safety clearance of at least 4 cm from the antenna in operation.

Procedure:

1. Connect the antenna cable plug to the router (see Section 6.4 "Connecting the Cables to the Network Switch and Router", page 29).
2. Select the mounting location of the antenna. Take the maximum cable length of 5 m into account.
3. Check whether the signal strength at the selected mounting location is sufficient:
   - Log into the router (see Section 7.2 "Configuring the Router", page 33).
   - Read off the signal strength in the field **Signal strength**.

   The signal strength is sufficient if the field **Signal strength** is showing either **Good** or **Very good**.

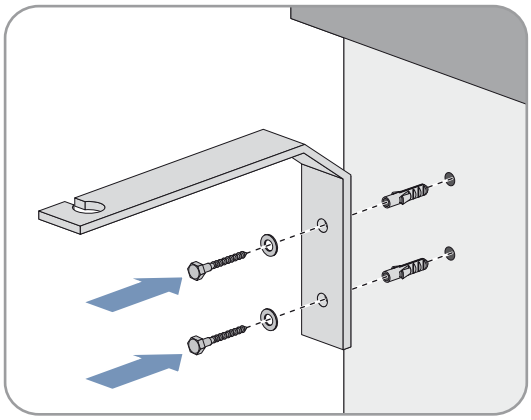
- Mount the antenna (see Section 5.5 "Mounting the Antenna", page 20).

The signal strength is insufficient if the field **Signal strength** is showing either **Bad** or **Low**.

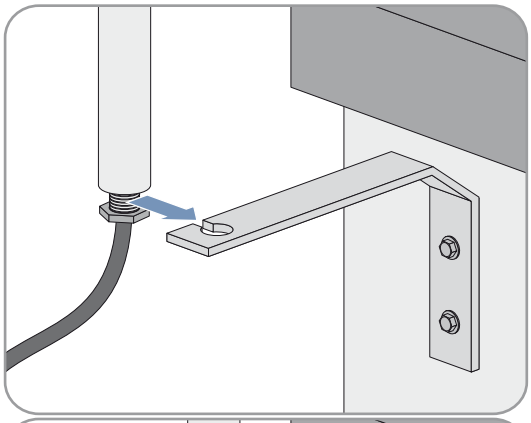
- Select a different mounting location.
- Repeat step 3.

5.5 Mounting the Antenna

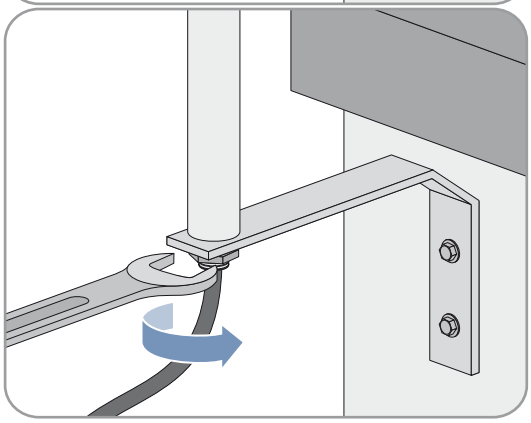
1. Mark the drill holes.
2. Drill holes with a diameter of 8 mm at the marked position.
3. Insert the screw anchors. Attach the bracket to the wall using the screws.



4. Loosen the screw connection from the antenna.
5. Using the cable, guide the antenna sideways into the bracket.



6. Tighten the antenna cable gland (torque: 20 Nm). Hold on to the antenna when doing this. This is in order to avoid twisting the cable.



7. Lay the cable to the router. If necessary, drill a hole in the station for feeding through the cable at a suitable place and use either a protective conduit or cable channel.

5.6 Installing Your Own Optional Device

If the Communit is fitted with one or two customer installation locations, you can install your own devices in the Communit.

Requirements:

- ☐ The device must be approved for operation at the mounting location, e.g. the device must have a valid declaration of conformity in Europe.
- ☐ The device can be mounted on a top-hat rail.
- ☐ The device must have suitable dimensions for the available space (see the Technical Information "Communit").
- ☐ The customer device must be suitable for the connection to the voltage supply (see the Technical Information "Communit").

Procedure:

- Mount each device on the top-hat rail.

6 Electrical Connection

6.1 Overview of the Connection Area

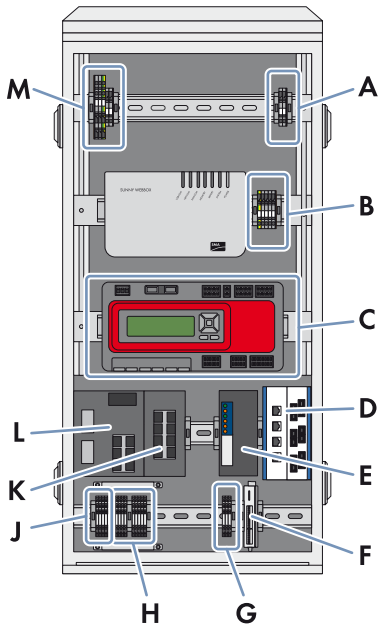


Figure 9: Installation locations and connections in the Communit (example)

Position	Designation
A	Connection of the customer device at installation location 1 to the DC voltage supply
B	Connection of the customer device at installation location 2 to the DC voltage supply
C	Connection to the Cluster Controller
D	Patch panel
E	Router
F	Connection to the I/O module
G	Connection to the voltage supply terminals for triggering the digital inputs
H	Connection of the Sunny SensorBox
J	Terminal for the Communit voltage supply
K	Network switch 1
L	Network switch 2
M	Connection of the customer device at installation location 1 to the AC voltage supply

6.2 Inserting the Cables into the Communication Distribution Unit

The individual devices in the communication distribution unit have been cabled. The cables are inserted through the cable glands in the floor of the Communit.

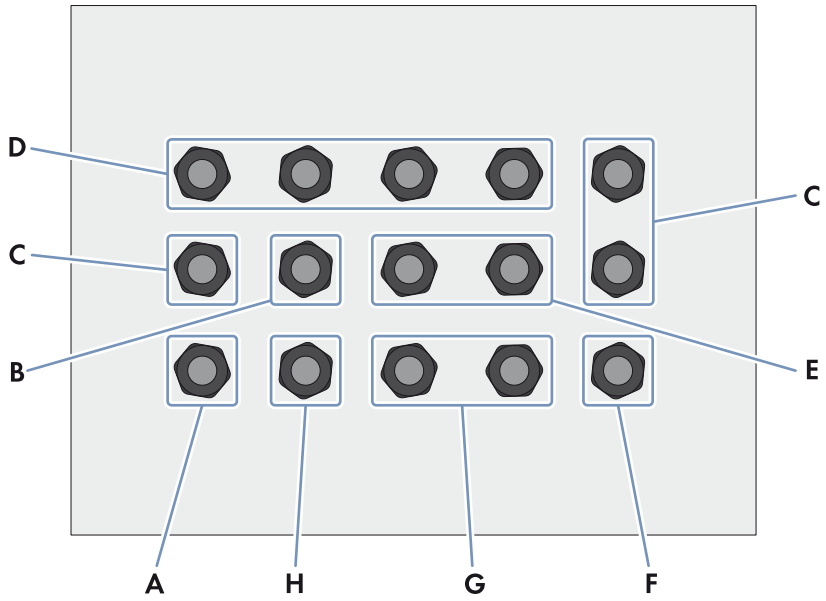


Figure 10: Cable glands in the floor of the Communit

Position	Recommendations for cable entry
A	For the supply voltage cable
B	For the Sunny SensorBox cable
C	For optical fibers
D	For the cables of the Cluster Controller and the I/O module
E	Reserve
F	For the antenna cable
G	For the network cables
H	Reserve

External strain relief of the supply voltage cable

The cable for the Communit supply voltage must be led to the Communit with sufficient strain relief. The external cable support rail is not included in the scope of delivery.

- Attach the supply voltage cable to an external cable support rail.

Unused cable glands

- Do not take the filler plugs out of the unused cable glands. The filler plugs serve as seals for the Communit.

NOTICE

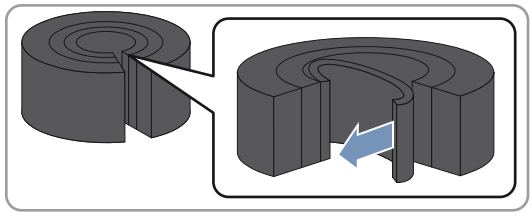
Damage to the Communit due to moisture penetration

Moisture can penetrate the Communit through unsealed cable glands.

- Only remove the number of sealing rings from the rubber seal in the cable gland that corresponds to the cable diameter.

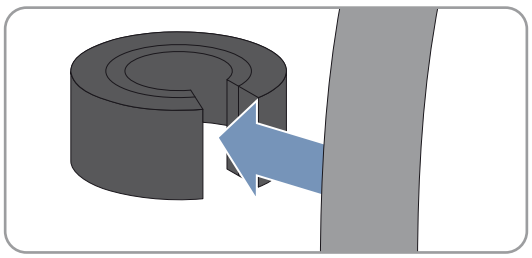
Procedure:

1. If necessary, remove the Communit door.
2. Remove the filler plug from the cable gland.
3. Remove the rubber seal from the cable gland.
4. Adjust the rubber seal to the diameter of the cable to be inserted:
   - Remove the appropriate number of sealing rings from the rubber seal.



Cable diameter	Number of sealing rings to be removed
4.5 mm to 5.0 mm	0
4.5 mm to 7.5 mm	1
7.0 mm to 10.0 mm	2
9.5 mm to 13.0 mm	3

5. Lead the cable through the swivel nut of the cable gland. Ensure that the thread of the swivel nut is facing upwards.
6. Insert the cable above the swivel nut sideways into the rubber seal.



7. Insert the rubber seal with the cable in the cable gland.
8. Cut the cable to length.
9. Tighten the cable gland.

6.3 Connecting the Cables to the Connecting Terminal Plates

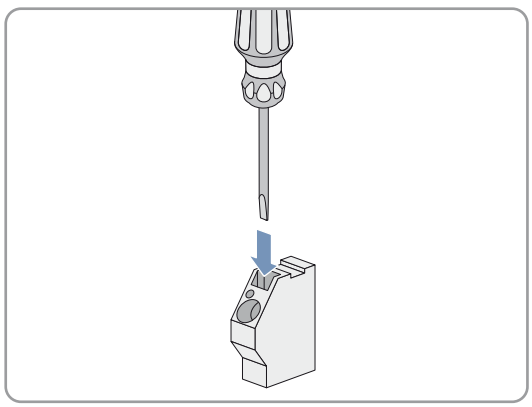
6.3.1 Connecting Conductors to the Spring-Cage Terminal

Connect each conductor to the corresponding spring-cage terminal as follows.

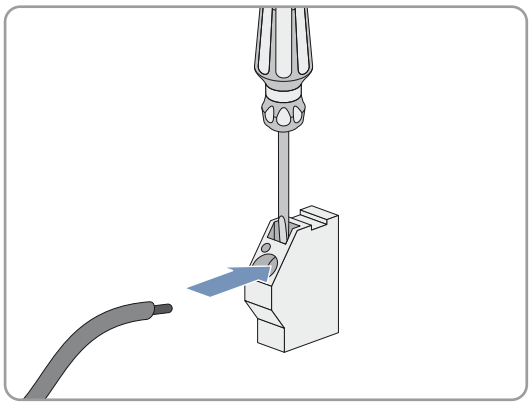
Procedure:

1. Insert the screwdriver into the clamping contact of the spring-cage terminal.

Connecting terminal plate	Screwdriver size
X300, X460	3.5 x 0.5
X500 to X530	2.5 x 0.4



2. Insert the conductor into the terminal up to the stop. Make sure that no insulation is clamped in the terminal.



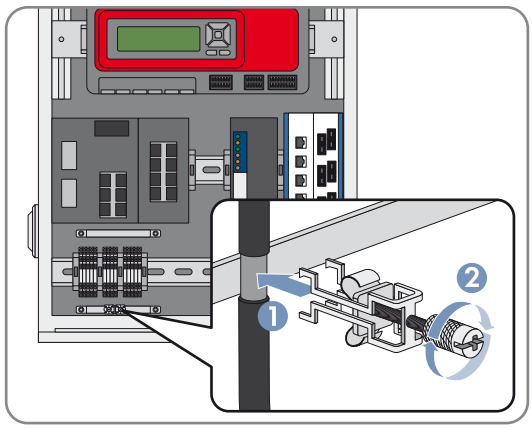
3. Remove the screwdriver.

6.3.2 Connecting the Cable Shield Contact

Connect the cable shield contact of each required cable in accordance with the following procedure.

Procedure:

1. Dismantle the data cable.
2. Completely unscrew the knurled screw of the shield clamping bracket. This forces the clamping legs apart.
3. Remove the shield clamping bracket. For this, tip the shield clamping bracket lightly to the side.
4. Fit the cable shield onto the shield bus.
5. Place the shield clamping bracket on the shield bus and cable shield.



6. Tighten the knurled screw (torque: 0.5 Nm).

6.3.3 Connecting the Communit Supply Voltage

Cable requirements:

- ☐ The cable for the supply voltage must also include a grounding conductor.
- ☐ Number of conductors: 3
- ☐ Conductor cross-section for rigid cables: 0.08 mm^2 to 4 mm^2
- ☐ Conductor cross-section for flexible cables: 0.14 mm^2 to 2.5 mm^2
- ☐ The cable must be suitable for the local grid voltage.

Requirements:

- ☐ No supply voltage must be present.
- ☐ The cable for the supply voltage must be correctly inserted in the Communit (see Section 6.2 "Inserting the Cables into the Communication Distribution Unit", page 23).

⚠ DANGER

Danger to life due to electric shock when voltage is present

Touching live components and cables results in death or serious injury due to electric shock.

- Install a disconnection device next to the Communit prior to installation work.
- Prior to cable connection, disconnect the supply voltage via the disconnection device.
- Observe the five safety rules when disconnecting the supply voltage:
  - Disconnect the device from voltage sources.
  - Ensure that the device cannot be reconnected.
  - Ensure that no voltage is present.
  - Ground and short-circuit the device.
  - Cover and isolate any adjacent live components.
- Observe the circuit diagram and the clamp allocations included in the delivery when connecting the cables in the communication distribution unit.

Procedure:

1. Dismantle the supply voltage cable.
2. Strip off the insulation of the conductors by 10 mm to 12 mm.
3. If you use bootlace ferrules, crimp the bootlace ferrules gas tight.
4. Connect the insulated conductors of the cable to the connecting terminal plate **=CU-X300** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.

Terminal	Signal
1	L
2	N
3	Grounding conductor

5. Ensure that the cable is securely in place.

6.3.4 Connecting the Cables for the SMA Cluster Controller

The communication devices of the Communit have been cabled. For the SMA Cluster Controller, the connecting terminal plates in the lower area of the Communit are omitted. Instead, the cables are connected directly to the SMA Cluster Controller (for information on connecting the cables, see the SMA Cluster Controller documentation).

6.3.5 Connecting the Cables for the I/O Modules

For measuring and controlling the devices of your PV system, the Communit can be optionally equipped with an Ethernet I/O module Moxa E1240 with eight analog channels or E1242 with four digital and four analog channels.

A 24 V_{DC} voltage supply is used to activate the digital inputs in the Communit. The connection is secured with a 315 mA fuse.

Cable requirements:

☐ Maximum conductor cross-section for connection to the I/O module: 2.5 mm^2

☐ Conductor cross-section for rigid cables for connecting the sensors to the voltage supply terminal: 0.08 mm^2 to 1.5 mm^2

☐ Conductor cross-section for flexible cables for connecting the sensors to the voltage supply terminal: 0.14 mm^2 to 1.5 mm^2

Procedure:

1. Strip off the conductor insulation of the cable by 10 mm.
2. If you use bootlace ferrules, crimp the bootlace ferrules gas tight.
3. Connect the insulated conductors of the cable to terminal **-X700** or terminal **-X701** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.
4. Connect the cables to the I/O module and configure the channels (see the documentation of the Ethernet I/O module).

6.3.6 Connecting the RS485 Cable of the Sunny SensorBox

SMA Solar Technology AG recommends using COMCAB-type SMA data cables which are available in various lengths as indoor and outdoor variants.

The communication devices of the Communit have been cabled. The Sunny SensorBox is connected to the connecting terminal plate in the lower area of the Communit (see Section 6.1 "Overview of the Connection Area", page 22). You will find further information on the RS485 communication bus in the RS485 cabling poster and in the Sunny SensorBox documentation.

Cable requirements:

☐ The RS485 cable must be shielded.

☐ Cross-section of the RS485 cable: 2 x 2 x 0.14 mm^2 to 2 x 2 x 1.5 mm^2

☐ The conductors Data+ and Data– are a twisted pair.

☐ Conductors +12V and GND are a twisted pair.

Requirements:

☐ No supply voltage is present.

☐ The RS485 cable is correctly inserted into the Communit (see Section 6.2 "Inserting the Cables into the Communication Distribution Unit", page 23).

☐ The shield of the RS485 cable is correctly fitted (see Section 6.3.4 "Connecting the Cables for the SMA Cluster Controller", page 26).

Procedure:

1. Strip off the insulation of the conductors of the RS485 cable by 9 to 11 mm.
2. Connect the conductors to the connecting terminal plates **-X520** and **-X530** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.

Terminal	Signal
Terminal 1	+12 V
Terminal 2	GND
Terminal 3	Data+
Terminal 4	Data–

3. Terminate the RS485 communication bus. Terminators must only be installed at the bus start and bus end.
4. Ensure that the RS485 cable is securely attached.

6.3.7 Connecting the Voltage Supply of Your Own Optional Devices

If the Communit is fitted with one or two customer installation locations, you can install your own devices in the Communit and connect them to the voltage supply.

Cable requirements:

- ☐ Number of conductors for the AC voltage supply: 3
- ☐ Number of conductors for the DC voltage supply: 2
- ☐ Conductor cross-section for rigid cables: 0.14 mm^2 to 1.5 mm^2
- ☐ Conductor cross-section for flexible cables: 0.14 mm^2 to 1.5 mm^2 (with bootlace ferrule: 0.14 mm^2 to 1.0 mm^2)
- ☐ The cable for the AC supply voltage must also include a grounding conductor.
- ☐ The electric strength of the cable must be suitable for the voltage present on site.

Requirements:

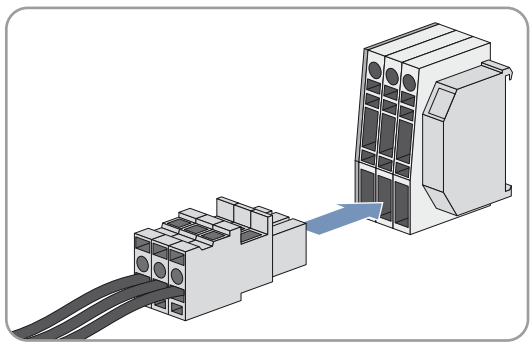
- ☐ The current and power consumption of the customer devices must not exceed the power reserve of the Communit (see the Technical Information "Communit").
- ☐ No supply voltage must be present.
- ☐ The cable must be correctly inserted in the Communit (see Section 6.2 "Inserting the Cables into the Communication Distribution Unit", page 23).

Connecting the Device at Installation Location 1

1. Strip off the conductor insulation of the cable by 8 mm.
2. If you are using bootlace ferrules, crimp them.
3. If you are using the AC voltage supply, connect the insulated conductors to the plugs of connecting terminal plate **-X320** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.

Terminal	Signal
1	L
2	N
3	Grounding conductor

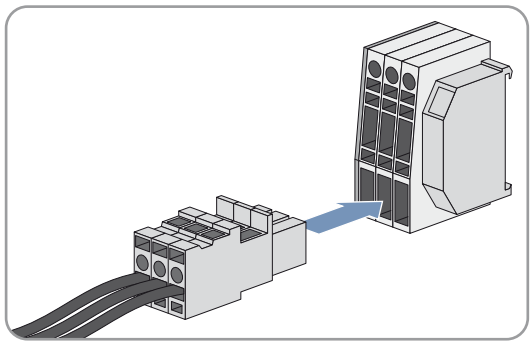
4. Insert the plug into the terminals.



5. If you are using the DC voltage supply, connect the insulated conductors to the plug of the connecting terminal plate **-X461** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.

Terminal	Signal
1	+24 VDC
2	0 VDC

6. Insert the plug into the terminals.



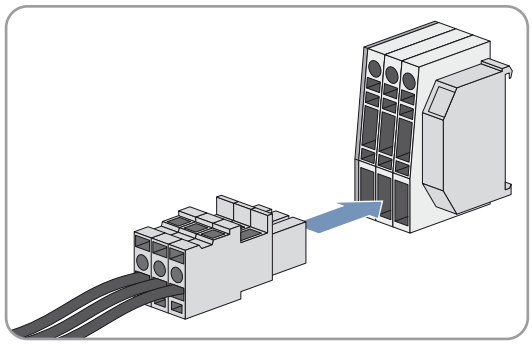
7. Ensure that the supply voltage cable is securely positioned.

Connecting the Device at Installation Location 2

1. Strip off the conductor insulation of the cable by 8 mm.
2. If you are using bootlace ferrules, crimp them.
3. Connect the insulated conductors to the connecting terminal plate **-X420** (see Section 6.3.1 "Connecting Conductors to the Spring-Cage Terminal", page 24). Observe the correct allocation and ensure that the insulation is not clamped.

Terminal	Signal
1	+24 VDC
2	0 VDC

4. Insert the plug into the terminals.



5. Ensure that the supply voltage cable is securely positioned.

6.4 Connecting the Cables to the Network Switch and Router

6.4.1 Connecting the Network Cables to the Network Switch

Network settings prior to connection

The devices installed in the Communit are delivered with a standard configuration. This can therefore lead to IP address conflicts when two or more Communits are used.

- If there is more than one Communit in the PV system, change the IP addresses of the devices in all Communits except one before connecting to the network (see Section 7 "Commissioning the Communit", page 33).

Requirement:

☐ If you use more than one Communit in the PV system, the devices of all Communits must have different IP addresses (see Section 7 "Commissioning the Communit", page 33).

Procedure:

- Connect the network cables to the network switch.

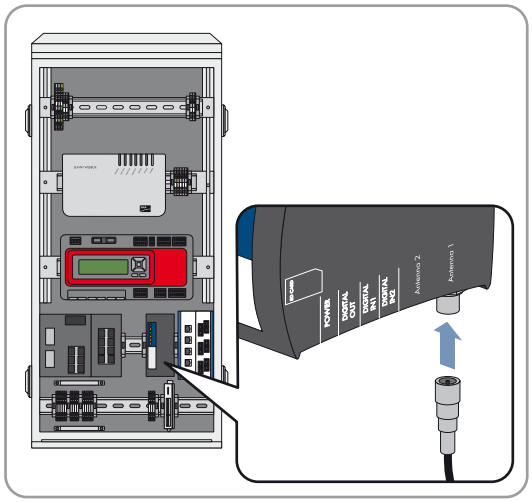
6.4.2 Connecting the Cable to the Router

Requirements:

☐ The antenna cable must be correctly inserted in the Communit (see Section 6.2 "Inserting the Cables into the Communication Distribution Unit", page 23).

Procedure:

- Connect the antenna cable to the router.



6.5 Splicing and Connecting the Optical Fiber

Additionally required material (not included in the scope of delivery):

☐ Connection fibers (optical fiber pigtails) of the appropriate glass fiber type with SC plugs

Requirements:

☐ The patch panel and the network switches must be suitable for the selected type of optical fiber.

☐ The optical fibers must be correctly inserted in the Communit (see Section 6.2 "Inserting the Cables into the Communication Distribution Unit", page 23).

⚠ CAUTION

Damage to eyes and skin due to visible and invisible laser radiation

The Communit contains class 1 LED or laser components in accordance with IEC 60825-1 (2003). Invisible laser radiation, wave length 1,300 nm.

The laser beam appears at the end of the optical fiber.

- Do not look into the laser beam.
- Do not look at the laser beam using optical instruments.
- Do not point the laser beam at people.

NOTICE

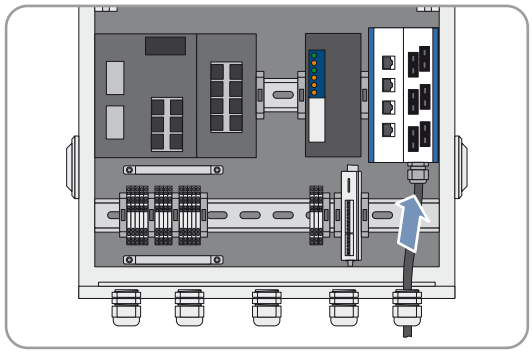
Damage to optical fibers due to too tight bend radii

Overly bending or kinking will damage the optical fiber.

- Observe the minimum permissible bend radii of the optical fibers.

Procedure:

1. Insert the optical fibers into the patch panel from below and splice using optical fiber pigtails (see the patch panel documentation). Observe the maximum permissible tension and the minimum permissible bend radii of the optical fibers.



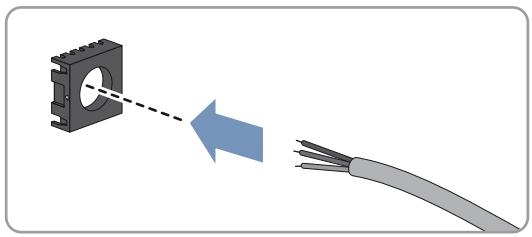
2. Connect the patch panel to the network switch using the optical fiber patch cables included in the delivery (bend radius: 100 mm). Observe the send and receive directions of the optical fiber nodes.

6.6 Connecting the Network Cable via the Keystone Jack

The modular patch panel enables the connection of copper cables and optical fiber cables. The module for the copper cables contains four RJ45 keystone pin connectors that are used to connect the network cables via keystone jacks.

Procedure:

1. Dismantle the network cable by 30 mm.
2. Fold back the braided shielding.
3. Remove the foil shield from the insulated conductor pairs.
4. With the adhesive side facing the inside, attach the aluminum foil from the outside so that it is flush with the braided shielding.
5. Lead the network cable into the cable organizer.

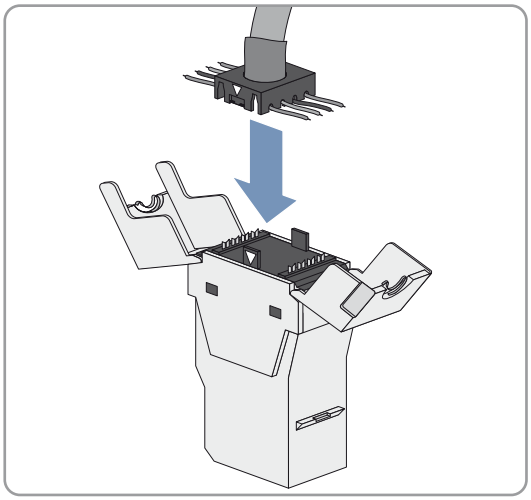


6. Insert the conductors into the slots of the cable organizer. Observe the appropriate color coding for the standard of your choice.

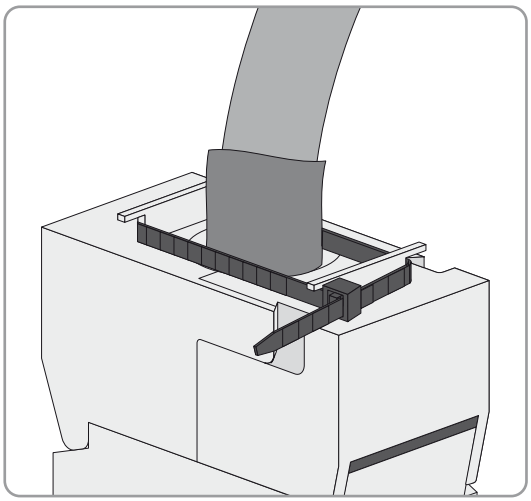
Insulated conductor pair	Insulated conductor color	Contact -568A	Contact -568B
1	white/blue	5	5
	blue	4	4
2	white/orange	3	1
	orange	6	2
3	white/green	1	3
	green	2	6
4	white/brown	7	7
	brown	8	8

7. Shorten protruding conductors.

8. Insert the cable organizer in the enclosure. Make sure that the white arrow of the cable organizer is pointing towards the white arrow on the enclosure.
   ☑ The cable organizer snaps into place.



9. Push the folding parts of the enclosure back together using a suitable pair of pliers (e.g. pipe wrench).
   ☑ The folding parts of the enclosure snap into place.
10. Secure the cable retainer of the enclosure with a cable tie.



11. Cut off the protruding end of the cable tie.
12. Connect the keystone jack to the network cable on the patch panel.
13. Use the patch cable to connect the patch panel to the network switch.

7 Commissioning the Communit

7.1 Information on Commissioning

Requirements for commissioning:

☐ The supply voltage is correctly connected and tested.

☐ Unused cable glands are closed via the sealing plugs included in the delivery.

☐ All cable glands are tightened and sealed.

The network settings of the communication devices deviate from the default settings of the respective manufacturer.

Network settings prior to connection to the network

The devices installed in the Communit are delivered with a standard configuration. This can therefore lead to IP address conflicts when two or more Communits are used.

- If there is more than one Communit in the PV system, change the IP addresses of the devices in all Communits devices except one before connecting to the network.

Labels with IP addresses

Labels with the factory set IP addresses are present on the communication devices.

- If you change the IP address of a communication device, make a note of the new IP address on the respective label.

7.2 Configuring the Router

When delivered, the router is configured with default settings for the communication with a modem via the network protocol "Point-to-Point-Protocol over Ethernet" (PPPoE). If your modem uses other network protocols, the router must be configured differently. Contact your distribution partner or the SMA Service Line.

Login data

- IP address: 172.16.0.1
- Subnet mask: 255.255.0.0
- Password for the user group "installer": 1111
- Password for the user group "user": 0000

SIM card

- Before you insert the SIM card in the router, clean the SIM card using a lint-free cloth and alcohol.
- Only insert the SIM card into the router when the router is switched off.

Procedure when replacing the SIM card

When a different SIM card is inserted, the router addresses the SIM card with a stored PIN. If this PIN does not correspond to the new SIM card, the SIM card is locked.

- Enter the new PIN and save before inserting the new SIM card in the router.

Procedure:

1. Connect the computer to the router.
2. Start web browser (e.g. Internet Explorer).
3. Enter the IP address of the router in the address bar and press the enter key.
4. Select [**OK**].
5. Select **Connectivity Settings > Internet Settings** in the menu.

6. Enter the data of your internet provider in the area **Internet Settings**:
   - Ensure that the correct type of Internet connection is selected in the drop-down list of the field **Internet Service**.
   - Select [**Set**].
   - If you use UMTS/GPRS as Internet connection, enter the APN of the Internet provider in the field **APN / Phone Number**.
   - Enter the user name for Internet access in the field **Username**. The user name is provided by the Internet provider.
   - Enter the password for Internet access in the field **Password**. The password is provided by the Internet provider.
   - Re-enter the password for confirmation in the field **Verify password**.
   - Select [**SAVE**].
7. If your SIM card is protected with a PIN, select **Connectivity Settings > Modem Settings** in the menu.
8. Activate the checkbox **SIM-PIN**.
9. Enter the PIN of the SIM card in the field **PIN**.
10. Re-enter the PIN for confirmation in the field **Verify PIN**.
11. Select [**SAVE**].
12. Activate the monitoring of the digital inputs 1/2 in order to allow an e-mail to be sent in the event of a redundant power supply unit fault:
    - Select **I/O Settings** in the menu.
    - Activate the checkbox **Activate**.
    - In the drop-down list **Signal action**, select the value **Alarm - Send E-Mail**.
    - If necessary, enter the e-mail text in the field **Message**.
    - Select [**SAVE**].
13. Restart the router:
    - Select **Home** in the menu.
    - Select [**REBOOT**].

    ☑ The router will save the set data and restart.

7.3 Configuring the Network Switch

The network settings of the network switch deviate from the default settings of the manufacturer.

Login data

- IP address of the first network switch: 172.16.1.91
- If the second network switch is available, IP address of the second network switch: 172.16.1.92
- Subnet mask: 255.255.0.0
- Gateway: 172.16.0.1
- Password for the user group "admin": private

Procedure:

1. Connect the computer to the network switch.
2. Start web browser (e.g. Internet Explorer).
3. Enter the IP address of the network switch into the address bar and press the enter key.
4. Select the user group in the drop-down list.
5. Enter the user group password.
6. Select [**OK**].
7. Select **Basic settings > Network** in the menu.
8. Enter the desired IP address in the field **IP address**.
9. Select [**Set**].

☑ The network switch will save the set data.

7.4 Commissioning the Sunny WebBox

Login data

IP address of the Sunny WebBox: 172.16.1.41

Subnet mask: 255.255.0.0

Procedure:

- Configure the Sunny WebBox (see the Sunny WebBox documentation).

8 Communit Maintenance Work

8.1 Maintenance Interval

- Perform maintenance work on the Communit every 24 months.

8.2 Checking the Mounting Location and Installation of the Communit

- Ensure that the mounting location is easily accessible without the need of additional equipment.
- Ensure that the Communit is securely mounted.

8.3 Checking the Enclosure and Enclosure Interior

- Check whether the Communit enclosure is damaged or soiled.
  If the enclosure is severely damaged, contact the SMA Service Line.
- Ensure that the enclosure is clean.
- Ensure that the vent plugs in the Communit enclosure are intact and clean.
- Ensure that the door lock is intact and clean.
- Check whether the surrounding seals on the door frames are intact.
  If the seals are damaged, replace them.
- Ensure that all cable glands are tightly sealed.

8.4 Checking the Supply Voltage

- Check whether the power supply units are in operation.
  If the LED on the redundancy module is glowing, the power supply units are in operation.
  If the LED on the redundancy module is not glowing, contact the SMA Service Line.

9 Decommissioning

9.1 Disassembling the Communit

Requirement:

☐ No supply voltage is present.

Procedure:

1. Open the Communit door.
2. Disconnect all router cables.
3. Disconnect all network switch cables.
4. If available, disconnect the optical fibers.
5. Disconnect all cables from the connecting terminal plate.
6. Loosen the cable glands.
7. Pull out all cables through the cable glands.
8. Disassemble the Communit.

9.2 Disposing of the Communit

- Dispose of the Communit in accordance with the applicable disposal regulations for electronic waste.

10 Troubleshooting

Symptom	Cause and corrective measure
No system communication	Configuration error **Corrective measure:** • Ensure that all communication devices for the PV system network are correctly configured (see information on IP address allocation in the Technical Information "Plant Communication in Large-Scale PV Power Plants" at www.SMA.de).
	Cabling error in the RS485 cable **Corrective measure:** • Ensure that the RS485 cable is connected correctly (see Section 6.3 and the poster "RS485 Cabling Plan").
	Error in the patch cable connection **Corrective measure:** • Ensure that the send and receive direction of the optical fiber nodes is correct.
Communication disturbance	Unsuitable antenna mounting location **Corrective measure:** • Determine the optimum mounting location for the antenna (see Section 5.4 "Determining the Optimum Mounting Location for the Antenna", page 19).

11 Technical Data

Enclosure	
Outdoor installation	Shaded
Base mounting*	Yes
Wall mounting*	Yes
Material	Fiberglass-reinforced polyester
Color	RAL 7035
Lock cylinder**	Double-bit key for switch cabinet

* optional
** prepared for customer mounting of a profile half-cylinder

Mechanical Data of the Enclosure without Base	
Width x height x depth	427 mm x 868 mm x 345 mm
Weight*	38 kg to 45 kg

* depending on the option ordered

Mechanical Data of the Enclosure with Base	
Width x height x depth	427 mm x 2,032 mm x 340 mm
Depth	660 mm
Weight*	38 kg to 45 kg

* depending on the option ordered

Option-Dependent Features	
Maximum number of DSL/GSM/GPRS/UMTS routers*	1
Maximum number of Ethernet routers	1
Sunny WebBox with Sunny SensorBox	1 each
Maximum number of SMA Cluster Controllers	1
Maximum number of Ethernet network switches	2
Maximum number of patch panels**	1
Maximum number of Ethernet I/O modules	1

* including external antenna
** including splice cassette for optical fiber module

Ethernet I/O Module Moxa ioLogik E1240	
Number of analog channels	8
Maximum conductor cross-section for connection to the I/O module	2.5 mm^2
Conductor cross-section for connecting sensors to the voltage supply terminal	0.14 mm^2 to 1.5 mm^2

Ethernet I/O Module Moxa ioLogik E1242	
Number of analog channels	4
Number of digital channels	4
Configurable digital inputs/outputs	4
Maximum conductor cross-section for connection at I/O module	0.14 mm^2 to 1.5 mm^2

Analog Inputs of the I/O Modules Moxa ioLogik E1240 and E1242	
Type	Differential input
Resolution	16 bit
I/O mode	Voltage/current
Input voltage range	0 V_{DC} to 10 V_{DC} / 0 mA to 20 mA / 0 mA to 20 mA
Accuracy at 25°C / at –10°C to +60°C / at –40°C to +75°C	±0.1% FSR / ±0.3% FSR / ±0.5% FSR

Digital Inputs of the I/O Module Moxa ioLogik E1242	
Sensor type	Potential-free contact / wet contact (NPN or PNP)
I/O mode	Digital input or event counter
Potential-free contact	On: Short circuit to ground / Off: No-load operation
Wet contact NPN (DI to ground)	On: 0 V_{DC} to 3 V_{DC} / Off: 10 V_{DC} to 30 V_{DC}
Wet contact PNP (DI to ground)	Off: 0 V_{DC} to 3 V_{DC} / On: 10 V_{DC} to 30 V_{DC}
Number of inputs per COM	4

Digital Outputs of the I/O Module Moxa ioLogik E1242	
Type	Sink
I/O mode	Digital output or pulse output
Pulse output frequency	500 Hz
Overvoltage protection	45 V_{DC}
Overcurrent protection	2.6 A (4 channels at 650 mA)
Overtemperature protection	minimum 150°C / typical 175°C
Current load	200 mA

Option-Dependent Interfaces	
Communication	DSL / GSM / GPRS / EDGE / UMTS / Ethernet / Speedwire / RS485 communication

Grid Connection	
Nominal voltage	100 V to 240 V
Supply voltage	24 V
Frequency	50 Hz/60 Hz

Grid Connection	
Nominal current	1.6 A to 0.7 A
Maximum back-up fuse	16.0 A
Type of connection*	Spring-cage terminals
Conductor cross-section for flexible cables	0.14 mm^2 to 2.5 mm^2
Conductor cross-section for rigid cables	0.08 mm^2 to 4 mm^2

* L, N and PE connection

Grid Connection of the Optional Customer Device at Installation Location 1	
Voltage supply	230 V_{AC} / 24 V_{DC}
Maximum power consumption at 230 V_{AC}	20 W
Maximum power consumption at 24 V_{DC}	depending on the option
Type of connection	X-COM® plug
Conductor cross-section	0.14 mm^2 to 1.5 mm^2 / with bootlace ferrule 0.14 mm^2 to 1.0 mm^2

Grid Connection of the Optional Customer Device at Installation Location 2	
Voltage supply	24 V_{DC}
Maximum power consumption at 24 V_{DC}	depending on the option
Type of connection	X-COM® plug
Conductor cross-section	0.14 mm^2 to 1.5 mm^2 / with bootlace ferrule 0.14 mm^2 to 1.0 mm^2

Connection of the Sunny SensorBox	
Type of connection	Spring-cage terminals
Number of insulated conductors and cable cross-section	2 x 2 x 0.14 mm^2 to 2 x 2 x 1.5 mm^2

Degree of Protection and Ambient Conditions	
Degree of protection*	IP54
Permissible ambient temperatures	–20°C to +50°C
Relative humidity**	5% to 95%
Pollution degree***	2
Maximum altitude above mean sea level, MSL****	4,000 m

* as per EN 60529
** non-condensing
*** as per DIN EN 50178:1997
**** For installation altitudes above 2,000 m, the overvoltage category is reduced to class II.

12 Contact

If you have technical problems concerning our products, please contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Communit serial number
- Article number

Australia	SMA Australia Pty Ltd. Sydney Toll free for Australia: 1800 SMA AUS (1800 762 287) International: +61 2 9491 4200	Belgien Belgique België Luxemburg Luxembourg Nederland	SMA Benelux BVBA/SPRL Mechelen +32 15 286 730
Argentina Brasil Chile Perú	SMA South America SPA Santiago +562 2820 2101	Česko Magyarország Polska România Slovensko	SMA Central & Eastern Europe s.r.o. Praha +420 235 010 417
Danmark Deutschland Österreich Schweiz	SMA Solar Technology AG Niestetal SMA Online Service Center: www.SMA.de/Service Sunny Boy, Sunny Mini Central, Sunny Tripower: +49 561 9522-1499 Monitoring Systems (Kommunikationsprodukte): +49 561 9522-2499 Fuel Save Controller (PV-Diesel Hybrid-systeme): +49 561 9522-3199 Sunny Island, Sunny Backup, Hydro Boy: +49 561 9522-399 Sunny Central: +49 561 9522-299	France	SMA France S.A.S. Lyon Sunny Boy, Sunny Mini Central, Sunny Tripower : +33 472 09 04 40 Monitoring Systems : +33 472 09 04 41 Sunny Island : +33 472 09 04 42 Sunny Central : +33 472 09 04 43
España Portugal	SMA Ibérica Tecnología Solar, S.L.U. Barcelona +34 935 63 50 99	India	SMA Solar India Pvt. Ltd. Mumbai +91 22 61713888
South Africa	SMA Solar Technology South Africa Pty Ltd. Centurion (Pretoria) 08600 SUNNY (08600 78669) International: +27 (12) 622 3000	Ελλάδα Κύπρος Kıbrıs България	SMA Hellas AE Αθήνα 801 222 9 222 International: +30 212 222 9 222
Italia	SMA Italia S.r.l. Milano +39 02 8934-7299	United Kingdom	SMA Solar UK Ltd. Milton Keynes +44 1908 304899

ไทย	SMA Solar (Thailand) Co., Ltd. กรุงเทพฯ +66 2 670 6999	대한민국	SMA Technology Korea Co., Ltd. 서울 +82-2-520-2666
الإمارات العربية المتحدة	SMA Middle East LLC أبو ظبي +971 2 234-6177	Other countries	International SMA Service Line Niestetal Toll free worldwide: 00800 SMA SERVICE (+800 762 7378423)

SMA Solar Technology

www.SMA-Solar.com